

7. (New) The optoelectronic logic gate of Claim 2 wherein said photoreactive molecule comprises an electron donor, an electron acceptor and a chromophore.
8. (New) The optoelectronic logic gate of Claim 2 wherein said electron donor is a carotene.
9. (New) The optoelectronic logic gate of Claim 2 wherein said electron acceptor is a fullerene
10. (New) The optoelectronic logic gate of Claim 2 wherein said chromophore is a porphyrin.
11. (New) The optoelectronic logic gate of Claim 2 wherein said photoreactive molecule comprises a carotene, a fullerene and a porphyrin.
12. (New) The optoelectronic logic gate of Claim 2 wherein said transient species is a long-lived charge-separated molecule capable of decaying by radical pair recombination to yield the triplet state.
13. (New) The optoelectronic logic gate of Claim 8 wherein the lifetime of said transient species is extended by application of a magnetic field.
14. (New) A means for generating magnetic field signals to the transient species of Claim 2 comprises a Helmholtz coil in magnetic contact with said transient species.
15. (New) The optoelectronic logic gate of Claim 2 comprising in addition a means for selectively controlling the time period during which said magnetic signals are generated.
16. (New) The optoelectronic logic gate of Claim 1 wherein said means for selectively accessing and delivering said stored signals for signal processing comprises:
 - a. means for activating said transient species;
 - b. means for applying a magnetic field to said transient species for a selected period of time;
 - c. means for transmitting an optoelectronic radiation signal through said transient species;
 - d. means for receiving the transmitted optoelectronic radiation signal in the presence of the magnetic field,

wherein processing of said transmitted electromagnetic radiation signal comprises comparison of said received signal to a threshold value to provide a Boolean yes/no signal.

17. (New) The optoelectronic logic gate of Claim 12 wherein said electromagnetic radiation signal is light of known wavelength and the difference between incident and transmitted signal is the absorbance or per cent transmission of said light.

18. (New) The optoelectronic logic gate of Claim 12 wherein said electromagnetic radiation signal is electronic and said difference between said incident and transmitted signal is the conductance or capacitance of said electronic signal.

19. (New) A digital device comprising the magnetically controlled logic gate of Claim 1 wherein processing of said transmitted electromagnetic radiation signal comprises comparison of said signal to a threshold value to provide a Boolean yes/no signal.

20. A magnetically controlled optoelectronic logic gate of Claim 1 comprising:

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- a. a photoreactive molecule capable of forming transient species when activated by an electromagnetic radiation signal, the lifetime of said transient species being altered in the presence of a magnetic field;
 - b. means for activating said photoreactive molecule to form said transient species;
 - c. means for delivering a magnetic field signal to said transient species for a selected period of time;
 - d. generator means for transmitting an optoelectronic signal through said transient species;
 - e. monitor means for detecting the transmitted optoelectronic signal in the presence and absence of magnetic field signal; and
 - f. output means for delivering signals from said monitor means to a signal processor.

21. The logic gate of Claim 16 in a computer processor.
